Master of Science in Molecular Entomology

Molecular Entomology program is designed to provide in-depth knowledge on various aspects of Insect Science and its application to research and development in plant, human, animal and environment health, which is in line with the JKUAT mission and vision. The program is tailored to help formulate adequate strategy to fast track application of entomology in addressing research questions and provide solutions to be used for development of viable products maintain environmental diversity and add value to the quality of life.

The degree programme will be offered at the Department of Biochemistry of Jomo Kenyatta University of Agriculture and Technology. Students will be exposed to theoretical and practical aspects of Insects systematics, population genetics, genome organization, physiology, diversity, pathology, biotechnology and toxicology, with emphasis on molecular aspects.

COURSE OBJECTIVES

1. To provide students with advanced knowledge on different aspects of Molecular Entomology.
2. To provide students with practical skills relevant to entomological research.
3. To expose students to recent advances in insect research and its application to plant, human, animal and environmental health.

COURSE JUSTIFICATION

Insects are important and play a major role in the balance of ecosystems. They are a major concern because of the beneficial products they produce and disease burden some cause. As such, there is need to study and appreciate the role insects play in our lives. The beneficial products can be exploited as an income generating project thus improve quality of life and contribute towards achievements of Millennium Development Goals (MDGs). The disease vectors can be studied with an aim of designing better control methods that will result in reducing disease burden. Much effort is being made to understand interactions of insects in/with the environment. With the recent advances in fields of Biochemistry, Molecular Biology, Bioinformatics, Biotechnology and other life sciences, research information generated has contributed immensely to better understanding of insects as organisms that can be exploited for the benefit of human well being. This course aims to train and equip students with current knowledge, skills and techniques that can be used in entomological research spur development.

Regulations and syllabus for the Degree of Master of Science in Molecular Entomology

1 .0 Entry Requirements

1 .1 The common regulations for all masters degrees in the University shall apply.

1.2 The general regulations for all masters’ degrees in the Faculty/School shall apply.

1.3 The following shall be eligible for registration for the Master of Science degree in Molecular Entomology,

1.3.1 A holder of at least a Second Class Honours (Upper Division) degree having studied Biochemistry as a major or regular subject.

1.3.2 A holder of Bachelor of Science degree in any relevant Biological Sciences with at least Second Class Honours (Upper Division).

1.3.3 A holder of a Second Class Honours (Lower Division) Degree in any relevant Biological Sciences, under exceptional circumstances, be considered provided he/she produces evidence of having worked for at least **three** years in Biological related field with at least one publication in a refereed journal.

1.3.4 A holder of a degree accepted as equivalent to one of the degrees mentioned in 1.3.1 to 1.3.3 above from another University recognized by Senate.

2.0 Duration and Pattern of the Course

2.1 The duration of the Master of Science in Molecular Entomology shall be at least two academic years (18 months) from the date of registration.

2.2 Students taking Master of Science in Molecular Entomology shall follow any of the following programmes;

2.2.1 **Either** course work, examination and thesis,

2.2.2 **Or** research and thesis only.

2.3 In the first year students shall take ten units which shall be assessed by course-work and examination. Each unit shall comprise lectures which shall include tutorials, discussions and practicals. In addition, students will be required to attend/present Departmental seminars.

2.4 In the second year students will undertake research, seminar presentation (at least **two** seminars on their research work) and thesis writing.

2.5 Students taking the programme by research or thesis only shall:

2.5.1 Present a research proposal to the departmental postgraduate board before formal registration by Board of Postgraduate studies.

2.5.2 Upon successful registration, the student shall commence on the research and present quarterly reports to Board of Postgraduate studies during the course of the study.

2.5.3 That the regulations for thesis/dissertation/project outlined in section 4.0. shall apply.

First Year

First Semester

Core Units

1. SBH 3100 Research Methodology
2. SBH 3101 Advanced Molecular Biology
3. SBH 3126 Molecular Taxonomy and Systematics
4. SBH 3127 Molecular Insect Physiology

Elective Units

1. SBH 3129 Integrated Pest Management
2. SBH 3130 Environmental Entomology

Second Semester

Core Units

1. SBH 3102 Bioinformatics
2. SBH 3128 Population Genetics
3. SBH 3131 Biotechnology in insect control
4. SBH 3132 Insect Genome Organization

Elective Units

1. SBH 3133 Toxicology
2. SBH 3134 Insect Pathology